

Name(s) of Risk Team Members: A. Etkin, M. Okamura				Point Value → Parameter ↓		1		2		3		4		5			
Job Title: Class IV Laser Spot Size Adjustment and Realignment During Ion Source Experiment				Frequency (B)		≤once/year		≤once/month		≤once/week		≤once/shift		>once/shift			
Job Number or Job Identifier: JRA 8-07																	
Job Description: Optimization of laser beam spot on target for a laser driven ion source study.				Severity (C)		First Aid Only		Medical Treatment		Lost Time		Partial Disability		Death or Permanent Disability			
Training and Procedures List (optional): Laser Safety Training,				Likelihood (D)		Extremely Unlikely		Unlikely		Possible		Probable		Multiple			
Approved by: <i>E. Lessard</i> Date: 4-24-07      Rev. 0																	
Stressors (if applicable, please list all): Noise				Reason for Revision (if applicable):						Comments:							
				Before Additional Controls										After Additional Controls			
Job Step / Task	Hazard	Control(s)	Stressors Y/N	# of People A	Frequency B	Severity C	Likelihood D	Risk* AxBxCxD	Control(s) Added to Reduce Risk	Stressors Y/N	# of People A	Frequency B	Severity C	Likelihood D	Risk* AxBxCxD	% Risk Reduction	
Shutoff Cryo Cooler system for target	Shock, Electrocution or Arc Flash	All equipment is listed or reviewed by CEE, Tier 1 inspections, disconnected cable policy, installations comply with applicable codes, procedures, training, distribution drawings, LOTO, energized electrical work permits, NFP 70 E PPE and training, energized electrical work permits, Kirk keys, ASSRC/ESRC reviews, qualified electricians and technicians, cabinet interlocks, postings, locked areas, guarding, work planning, GFCI, grounding standards, emergency procedures. Implementation of a plan to meet OSHA’s NRTL requirements, low power controls	N	1	4	1	2	8									

Shutoff Turbo pump system for target chamber	Shock, Electrocution or Arc Flash	All equipment is listed or reviewed by CEE, Tier 1 inspections, disconnected cable policy, installations comply with applicable codes, procedures, training, distribution drawings, LOTO, energized electrical work permits, NFP 70 E PPE and training, energized electrical work permits, Kirk keys, ASSRC/ESRC reviews, qualified electricians and technicians, cabinet interlocks, postings, locked areas, guarding, work planning, GFCI, grounding standards, emergency procedures. Implementation of a plan to meet OSHA's NRTL requirements, low power controls	N	1	4	1	2	8								
Isolate Target chamber from detector system and bleed target to air	Pinch/ scrap Hand	Training	N	1	4	1	2	8								
Remove access flange from target chamber	Drop flange	Training, proper tools, two people	N	2	4	2	2	32								
Adjust gas nozzle on cold finger	Pinch/ scrap Hand	Training	N	1	4	1	2	8								
Turn on oscillator laser stage power supply	Shock, Electrocution or Arc Flash	All equipment is listed or reviewed by CEE, Tier 1 inspections, disconnected cable policy, installations comply with applicable codes, procedures, training, distribution drawings, LOTO, energized electrical work permits, NFP 70 E PPE and training, energized electrical work permits, Kirk keys, ASSRC/ESRC reviews, qualified electricians and technicians, cabinet interlocks, postings, locked areas, guarding, work planning, GFCI, grounding standards, emergency procedures. Implementation of a plan to meet OSHA's NRTL requirements, low power controls	N	1	4	1	2	8								
Turn on amplifier laser stage at low power supply	Shock, Electrocution or Arc Flash	All equipment is listed or reviewed by CEE, Tier 1 inspections, disconnected cable policy, installations comply with applicable codes, procedures, training, distribution drawings, LOTO, energized electrical work permits, NFP 70 E PPE and training, energized electrical work permits, Kirk keys, ASSRC/ESRC reviews, qualified electricians and technicians, cabinet interlocks, postings, locked areas, guarding, work planning, GFCI, grounding standards, emergency procedures. Implementation of a plan to meet OSHA's NRTL requirements, low power controls	N	1	4	1	2	8								

Do preliminary alignment with class 3A laser	Exposure to beam	Sweep room to insure only trained personnel are in area, training, locked perimeter openings	N	2	4	1	2	16								
Enable class 4 laser	Exposure to beam	Swept all non-trained personnel from area, interlocked perimeter openings, training, PPE	N	2	4	1	2	16								
Operate class 4 laser at low power	Exposure to beam	Single shot on demand mode, swept all non-trained personnel from area, interlocked perimeter openings, training, PPE	N	2	4	1	2	16								
Confirm alignment of beam spot on target with appropriate display	Exposure to beam	Single shot on demand mode, swept all non-trained personnel from area, interlocked perimeter openings, training, PPE	N	2	4	1	2	16								
Replace access flange on target chamber	Drop flange	Training, proper tools, two people	N	2	4	2	2	32								
Turn on Turbo pump system for target chamber	Shock, Electrocution or Arc Flash	All equipment is listed or reviewed by CEE, Tier 1 inspections, disconnected cable policy, installations comply with applicable codes, procedures, training, distribution drawings, LOTO, energized electrical work permits, NFP 70 E PPE and training, energized electrical work permits, Kirk keys, ASSRC/ESRC reviews, qualified electricians and technicians, cabinet interlocks, postings, locked areas, guarding, work planning, GFCI, grounding standards, emergency procedures. Implementation of a plan to meet OSHA's NRTL requirements, low power controls	N	1	4	1	2	8								
Turn on Cryo Cooler system for target	Shock, Electrocution or Arc Flash	All equipment is listed or reviewed by CEE, Tier 1 inspections, disconnected cable policy, installations comply with applicable codes, procedures, training, distribution drawings, LOTO, energized electrical work permits, NFP 70 E PPE and training, energized electrical work permits, Kirk keys, ASSRC/ESRC reviews, qualified electricians and technicians, cabinet interlocks, postings, locked areas, guarding, work planning, GFCI, grounding standards, emergency procedures. Implementation of a plan to meet OSHA's NRTL requirements, low power controls	N	1	4	1	2	8								
Operate class 4 laser at high power to refine alignment and focus on target utilizing the ion beam	Exposure to beam	Single shot on demand mode, swept all non-trained personnel from area, interlocked perimeter openings, training, PPE, remote trigger, personnel remote from beam line	N	2	4	1	1	8								

*Risk:	0 to 20	21 to 40	41-60	61 to 80	81 or greater
	Negligible	Acceptable	Moderate	Substantial	Intolerable